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EDITORIAL

REPORT OF THE EDITOR OF THE AMERICAN JOURNAL OF PHARMACY—1935

THE Annual Volume of the AMERICAN JOURNAL OF PHARMACY shows every evidence of the pressure of the times in its much reduced content. Altogether it comprises 570 pages and represents a quality of material well up to its customary standards. Forty-six authors have contributed original presentations and there is less reprinted matter than ever in the long history of the JOURNAL. The Index, representing 15 pages and over 650 items is unusually complete and steps are under way to build a cumulative index which will be printed when and if funds are available. Such an index will be a valuable asset for libraries and for those who keep active files of the periodical.

The circulation of this periodical is not great but a breakdown of its mailing list will show a wide geographic distribution and a very select group of recipients, especially libraries and institutions where the unit finds a wide range of readers. To the far East—to Africa—the Indies—indeed to every corner of earth, each month the little JOURNAL journeys.

There is no other such publication in the English language that can glorify in well over a century of continued service. For throughout its existence it has kept faith in the art and science of pharmacy. It was the beacon light of professional pharmacy in 1825. Today one hundred and ten years later its light shines just as brightly. All through its existence it has been financially and otherwise supported by the Philadelphia College of Pharmacy and Science—as one of the many contributions of that venerable institution toward the cause of pharmacy and the allied sciences.

Founded in the serious-minded days of Quaker Philadelphia—it carries to this time, marks of its early training. For no one can deny its stolid dignity—nor feel that it has at any time belied its conservative inheritance.

When a man lives beyond the century mark it is considered a great achievement. Generally it is, for only a healthy heredity and a genius for wholesome living can account for such a lifespan. When the centenarian is asked to account for his longevity usually he answers that it is temperate habits—no smoking—no drinking—no overindulgence in anything except clean thinking and clean living.

Likewise the JOURNAL might well account for its eleven decades—in that it has never smoked the pipe of sensationalism—nor touched the cup of intemperate spirit, but that its whole lifetime has been spent honorably fulfilling its mission as a "Record of the Progress of Pharmacy and the Allied Sciences".

Only the simile falls short in that, with the centenarian, passing the threshold of the century is sure earnest of an early grave, whereas with the JOURNAL there is every hope for its prosperous and useful continuance and no thought of its end.

At one time during its existence the JOURNAL was the lone herald of American pharmacy—and in those days American pharmacy mothered many another then frail infant science. Botany, chemistry, bacteriology, biology,—were all too young, much too meagre minded to care for a separate existence. But since then they have all grown up—and in their prosperity they have almost forgotten the calling that mothered them.

In those early days when there was this commingling of interest it is not surprising to find the JOURNAL recording the articles of men like Pasteur, the genius of Arbois; Becquerel, the great apostle of the electro-chemical sciences; Claude Bernarde, the founder of the endocrine school; Berthelot, the great chemist; Berzelius the wizard of chemical arrangement; Bessemer, of steel fame; Bonjean and his ergotin; Boullay, pere et fils, the originators of percolation. Indeed the list of early contributors to the JOURNAL is a cross-section of the elite of the sciences in that day and generation, not only in America, but throughout the world of learning. Read this record of immortal names taken from the pages of its earliest volumes—and know thereby the proud heritage of this little book, that has held inviolate to its altruistic purpose and has weathered all the successes and all the vicissitudes

of an ever-changing trail of years in a long, long century. How large a share of work fell to these pioneers in American science, and how well their works endure.

Hare, Bache, Wood, and Procter, Carson, Egglesfield, Griffith, Daniel Smith, Bullock, Diehl, Dohme, Duhamel, Durand, Ebert, Ellis, Agassiz, Parrish, Powers, Remington, Rosengarten, Leidy, Squibb, Stearns, Weigand, Wormley and Wyeth. What a healthy American ring is even in the mention of their names—and what an impress was left by their honest Quaker works.

Nor was the JOURNAL ever restricted to domestic contributors, for the work of Continental scientists whose names still carry weight in their respective field are frequent in its list of contributors.

It is of the past we have spoken—of the days before the whirlwind—when men built edifices designed to last.

In this our generation, speed and specialization prevail—sentiment develops mostly about the present rather than about the past and art is higher than science.

But the JOURNAL has outlasted the fads of other generations—and today it stands well beyond the pinnacle of its first century, properly proud of its honorable past and supremely confident of an equally honorable future.

On a November evening in the year 1825, Daniel Smith, the first Editor—in his methodical, meticulous, Quaker way—wrote the following paragraph as the finishing touch to his introductory editorial for the first issue of a new journal. And the concluding paragraph is always the most difficult of the whole editorial. But this Quaker gentleman wrote with such quaintness of phrase and modesty of spirit that the present Editor borrows for this report the concluding sentiment from the kindly Daniel Smith—

"Should the JOURNAL of the Philadelphia College of Pharmacy contribute to these results by awakening and fostering a spirit of research and experiment, although labouring in an obscure and humble portion of the vineyard of science, it will reap rewards honourable to its contributors, and useful to the world at large."

IVOR GRIFFITH.

ORIGINAL ARTICLES

STUDIES ON PHYTOLACCA DECANDRA†
I. MORPHOLOGY OF YOUNG INFLORESCENCE

By Edmund H. MacLaughlin
Philadelphia College of Pharmacy and Science

Purpose of the Investigation

DURING a search of the literature prior to beginning a study to determine the location and exact nature of the chemical constituents of Phytolacca, it was noted that histological studies were decidedly incomplete. The information yielded pertained chiefly to those portions of the plant that have been extensively used as medicinal agents.

This preliminary work represents merely a beginning of the histological, cytological and chemical studies to be made on the entire plant.

Collection of Materials and Methods Used

The material of Phytolacca decandra was collected in the vicinity of Philadelphia. Suitable plants were chosen and portions of stems,

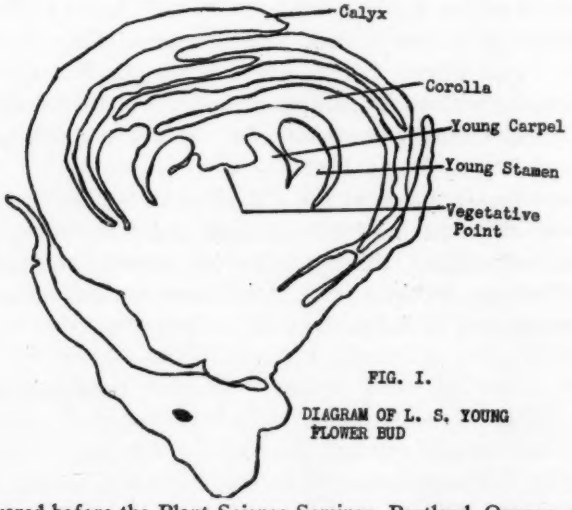

FIG. I.
DIAGRAM OF L. S. YOUNG FLOWER BUD

† Delivered before the Plant Science Seminar, Portland, Oregon, 1935.

leaves and roots were taken at 10-inch intervals throughout the entire length of the plant.

Killing and fixing were done at once in the field. Larger portions were placed in formalin-acetic acid-alcohol. Smaller portions and those for cytological studies were placed in Flemming's fluid.

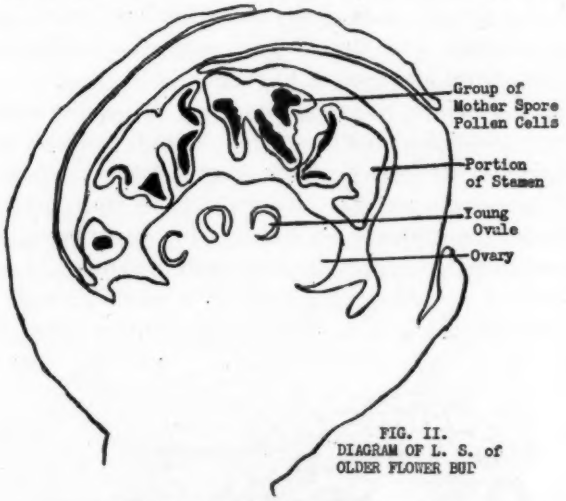

FIG. II.
DIAGRAM OF L. S. of
OLDER FLOWER BUD

Note—Some pollen cells show division.

The flower buds were imbedded in paraffin and sectioned longitudinally at 8 microns. Two stains were used, namely Heidenhain's hæmatoxylin with iron alum, and Flemming's triple stain. Materials killed in the Flemming's fixative gave dark precipitates in many of the cells and did not show great differentiation.

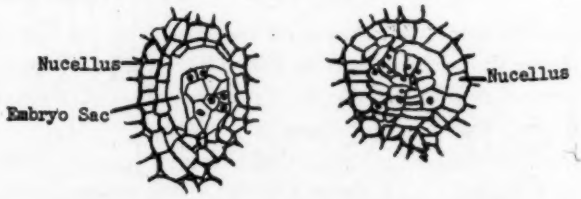

FIG. III.
YOUNG EMBRYO SACS ENLARGED FROM
FIG. II L. S.

Sketches were made, using a Bausch and Lomb drawing apparatus. Photomicrographs of suitable slides will be presented with later papers.

Discussion of the Diagrams

Figure I is an outline drawing showing the position of the various whorls of a very young flower bud. All differentiation at this stage is slight.

Figure II is an outline drawing of an older flower bud. The ovary with the young ovules shows more development, as well as the portions of stamens with the mother spore cells. Details of these structures are shown in subsequent figures.

Figure III shows tissue surrounding the embryo sacs. The nucellus is considerably developed into definite rows of cells. The cells appearing in the center of the diagrams are from the top and bottom of the nucellar tissue surrounding the sac. Serial sections did not reveal the presence of contents in the embryo sac at this stage, although it is possible that they were destroyed in sectioning. The presence of an archesporium cell in a much younger structure (Fig. V) would indicate this. Fig. III is an enlargement of portions of Fig. II.

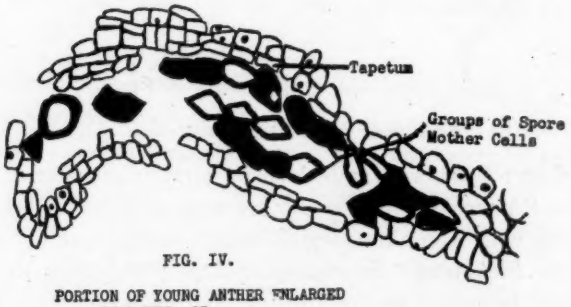

FIG. IV.

PORTION OF YOUNG ANTHER ENLARGED FROM FIG. II

Figure IV shows a portion of the tissue of the young anther enlarged from the section used in Fig. II. Groups of mother spore cells are present, but in contrast to the other tissues of the anther took a stain so deep that contents were not visible.

Figure V represents a longitudinal section through young anther, filament and carpel. The stamen is not differentiated to any great extent, the tissue being principally meristematic. The portion of the young ovary exhibits an archesporium.

Figure VI shows a longitudinal section through a young ovule taken from a flower but slightly older than shown in Fig. II. The nucellus is well developed. The integuments show differentiation

into definite layers. A break in the cells of the integuments indicates the presence of a micropyle.

Discussion

The young flower cluster of Phytolacca decandra used for making the sections discussed in this paper was one of the smallest obtainable from a group of plants. It is evident that little differentiation of tissues had taken place. The vascular elements and crystal cells common to the plant had not yet developed in the portions shown. The use of differential stains did not reveal the presence of mitotic figures in many of the cells examined, although the outer cells of the various whorls contained abundant dark-staining contents, apparent with both of the staining methods used. The information obtained will be used to further additional morphological studies before approaching those of the nature of the chemical contents of phytolacca.

FIG. V.

YOUNG ANTHER AND CARPEL - L. S.

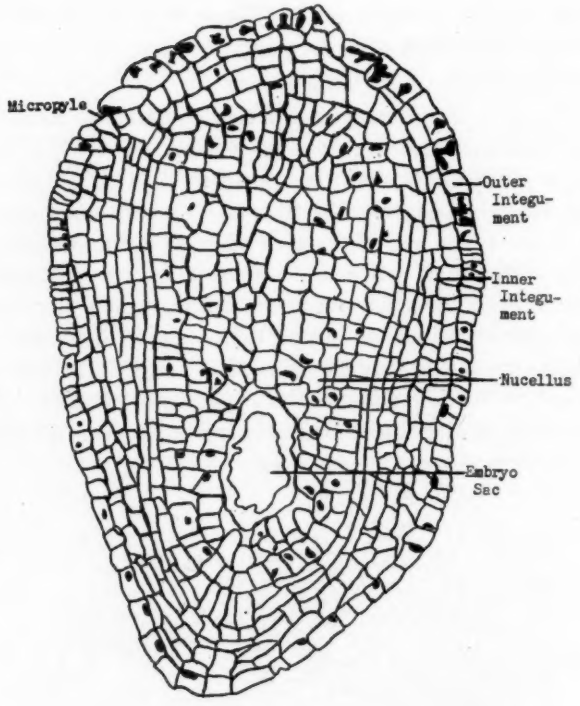

FIG. VI.

L. S. OF YOUNG OVULE
Note—Embryo sac is empty.

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AN ECONOMICAL AND SAFE APPARATUS FOR USE IN THE LABORATORY FOR HEATING INFLAMMABLE SOLVENTS†

By Bernard Melkon

Department of Biology of the Philadelphia College of Pharmacy and Science, Philadelphia, Pennsylvania

IT is quite helpful to know about certain simple, inexpensive and useful apparati, which have been developed and are in use in different laboratories.

In our biology laboratory, many times it is necessary to use inflammable volatile organic solvents for extractions, distillations or recovery, which might easily take fire if the heating system were inappropriate.

The following simple heating apparatus has been developed and found very satisfactory in our laboratory to minimize the fire hazard. (Figure 1) (Photo.)

Construction

Obtain a paint can (c) about 7½ inches in height and 6½ inches in diameter. Cut in its bottom a hole (P) 2 inches in diameter; cover the inside of this can with asbestos for insulation.

Use four wooden boards to construct a rectangle (I. L. J. M.) with two opposite sides open, of about the dimensions shown in Figure 1. (Area of top board should adequately support the can.) The basal board (J) of this rectangle should project (N) beyond the limits of the rectangle and serve as an anchorage for the support of the iron disc (K).

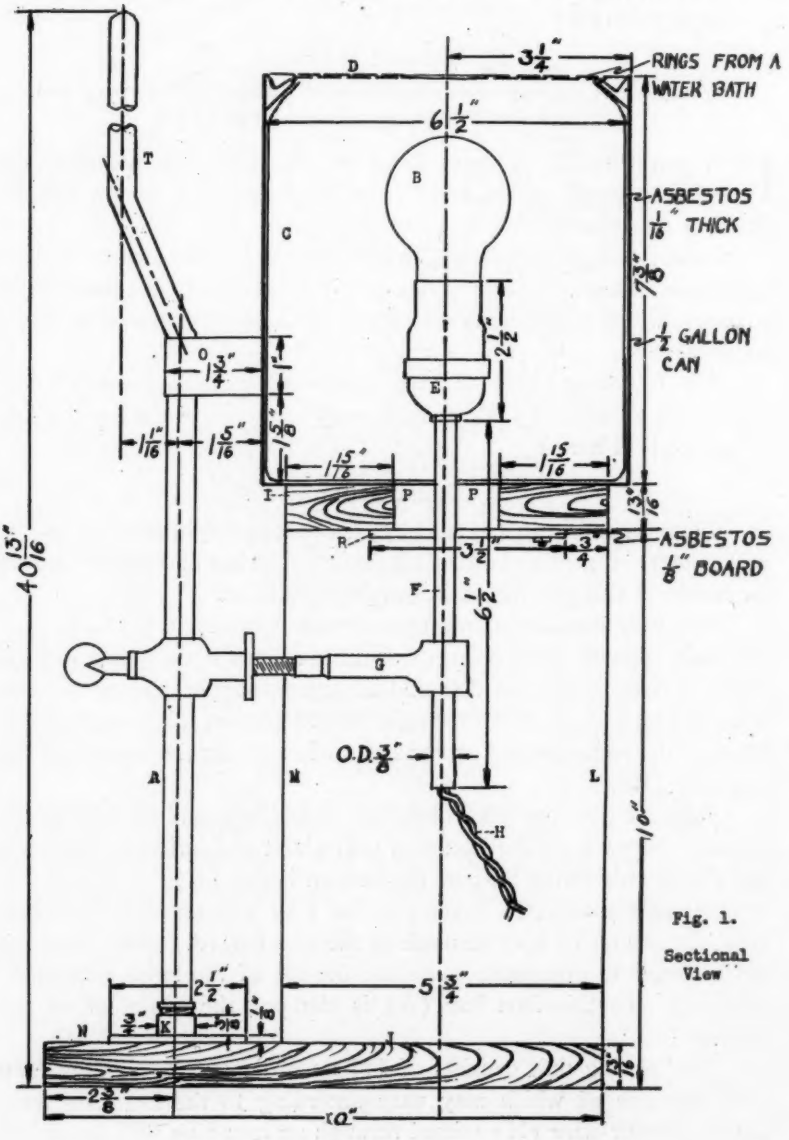
Take an iron bar (A) about 40 inches long and ½ inch in diameter. Screw it on the iron disk (K) about 2½ inches in diameter, and fasten this to the part of the bottom board (N).

Attach the can (C) to the iron bar (A) with an iron connection (O). A bend (T) may be made in the iron bar (A) away from the can in order to give more space for the use of the large containers. (Photo.) To this iron bar (A) is clamped the container of the solvent.

The heating unit consists of [1] an ordinary electric light bulb (B), the size of which may vary according to the heat required; [2] an electric wire (H) passed through an iron pipe (F) about 6½

† Delivered before the Plant Science Seminar, Portland, Oregon, 1935.

inches in length and 3/8 inch in diameter, connected with a standard socket (E) which is fastened to the top of the iron pipe (F). This



iron pipe (F) is inserted through the hole (P) and is held in vertical position by clamping it (G) to the upright iron support (A).

The electric bulb (B) can be raised or lowered in the can by raising or lowering the iron pipe (F).

The hole (P) may be closed by a piece of asbestos (R) of suitable size and shape fastened to the bottom of the top board (I) of the rectangular box.

Whenever a large bulb is used, it may be necessary to lower the socket (E) so that it projects through the hole (P), and then it is necessary to adjust the asbestos covering (R) of the hole.

Water bath covers (D) are used on the top of the can (C), upon which rests the container of the liquid to be heated. (Photo.)

Messrs. Harold J. Tormey and Thomas J. Harkins (1) of St. Bonaventure's College, have published the construction of a similar apparatus in the *Chemist-Analyst,* January, 1933.

Electric Heater.

In comparing their heating system with ours, we find that (1) they have used a rheostat, (2) the socket of their electric bulb is fastened in the bottom of the can, (3) the can is apparently uninsulated.

In our heating system (1) there is no need for a rheostat, which means less cost of construction, the degree of heat being obtained by an adjustable bulb of proper size, (2) the use of asbestos for insulation in the can, maintains constant temperature.

The accompanying diagram (Figure 1) will show the ease and simplicity of construction and give an idea as to its safety feature.

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(1) Tormey, Harold J., and Harkins, Thomas J.: "A Flask Heater for Use With Low Boiling Point Solvents." *Chemist-Analyst*, 22:22, January, 1933.

Cathartic Bread

A powerful coal-tar cathartic has no proper place in bread or any other product sold as a food. The Food and Drug Administration regarded phenolphthalein as an adulterant when it was used as an ingredient of what the manufacturer called a "laxative health bread." The Federal court at St. Louis, Mo., agreed with the food officials and imposed a $600 fine on Edward Ownen, Frank Dawdy and Glenn Allmon trading under the fancy name of Bakers' Research Co.

This concern had been selling "Ownen's Viti-Veg", a mixture of flour, bran and between 10 per cent. and 12 per cent. of phenolphthalein, a coal-tar cathartic, This mixture was recommended to bakers for addition to their regular bread mix. The product was to be marketed as "laxative health bread."

Bread, a staple article of the diet and consumed by everyone from infancy to old age, should not be used to mask the presence of a powerful laxative, is the opinion of the Food and Drug Administration. W. G. Campbell, Chief of the Administration, remarked today, "It is peculiarly appropriate that the deliberate perpetrators of this, one of the most flagrant types of adulteration uncovered in recent months, should receive one of the largest recent penalties—$600."

THE LEAF OILS OF WASHINGTON CONIFERS: TSUGA MERTENSIANA *[1]

By Charles Schwartz, Jr.

THE conifers, in general, yield volatile oils, many of which have gained prominence in both medicine and commerce. The "leaf" or "needle" oils present a particularly interesting class, in that they have found such frequent usage in the treatment of colds and bronchial disorders. These leaf oils are usually referred to as "pine needle oils", regardless of the source.

A survey of the work done prior to 1930 on the leaf oils of Washington conifers, recently made by Lehman and Lynn,(1) revealed that of the twenty-one conifers native to the state, the oils from only eight had been examined. The same authors thereupon investigated the leaf oils of Juniperus scopulorum (2), Pinus monticola (3), Tsuga heterophylla (4), and Picea sitchensis (5). Later reports have been made on the oils from Abies mobilis (6) and Juniperus occidentalis (7). Taxus brevifolia (8), also a Washington conifer, was found to differ from other species in not containing any volatile oil. The total number remaining unexamined, therefore, has been reduced to seven, namely: Tsuga mertensiana, Abies grandis, A. lasiocarpa, A. amabilis, Larix occidentalis, L. Lyalii, and Pinus albicaulis. Of these seven, the writer has examined the leaf oils of the first three named. Subsequent reports on A. grandis and A. lasiocarpa will follow.

Tsuga mertensiana (Bong.) Carr., known as "mountain" or "black" hemlock, has little general resemblance to the more familiar "western" hemlock (T. heterophylla). Its foliage might be easily mistaken by the casual observer for that of spruce, or possibly fir, except that the drooping, slender branches and its bark are suggestive of hemlock. The tree grows in alpine regions, mainly at the timber line, and ordinarily ranges in height from 25 to 60 feet. It endures very severe climate, even preferring north exposures.

The oil from T. heterophylla was investigated by Lehman and Lynn (4), who reported the following constituents as being present:

* This paper is part of a thesis submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy.

[1] Work done under the direction of Dr. Russell A. Cain, Instructor in Pharmacy, College of Pharmacy, University of Washington.

alpha pinene, beta pinene camphene, beta phellandrene, cadinene, picene (a new sesquiterpene), benzoic acid (free and combined), and probably borneol. A comparison of the latter oil with that from mountain hemlock should prove of interest, in that the trees themselves differ so greatly as to physical appearance and conditions of growth.

The leaves and twigs used for this analysis were collected in September, 1933, from small trees growing in the Cascade Mountains, near the summit of Snoqualmie Pass. From 380 pounds of fresh material, there was obtained by steam distillation 540 cc. of volatile oil, which represented a yield of 0.27 per cent.

The fresh oil was pale canary-yellow, had a pungent pinaceous odor, and dissolved in 95 per cent. alcohol. Its constants were determined and found to be as follows: $d\frac{20}{20}$ 0.8622; n_D^{20} 1.4736; $[\alpha]_D^{22}$ + 13.22; saponification number 26.265; acid number 2.108; ester number 24.157; per cent. of ester, calculated as borynl acetate 8.46; saponification number after acetylization 34.645; per cent. of total alcohol, calculated as borneol 9.56; per cent. of free alcohol, calculated as borneol .291.

Benzoic Acid. The free acid, which was extracted from the oil by means of 5 per cent. sodium carbonate solution, consisted of crystals which melted at 121° C. when recrystallized from benzene. No depression of melting point was observed when the crystals were mixed with pure benzoic acid. Their identity as benzoic acid was further confirmed by the formation of ethyl benzoate, as well as by other general qualitative tests.

Phenols. The oil was next extracted with 5 per cent. sodium hydroxide solution. The alkaline solution was shaken out with ether to remove adhering oil. Since the ethereal solution, in addition to containing traces of oil, might also contain carvacrol, it was dried and the solvent allowed to evaporate spontaneously. A very small amount of oily residue remained which failed to give the test for carvacrol upon the addition of ferric chloride solution. The aqueous alkaline solution was then made acid with dilute sulphuric acid and extracted with ether. A small amount of viscous, brownish residue was obtained which was colored deep by the addition of dilute ferric chloride solution. Traces of phenols were apparently present in the original oil, but no positive identification could be made.

Fractionation. The residual oil was washed repeatedly with water until free of alkalinity, dried with anhydrous sodium sulphate, and distilled several times up to 85° C. at 9 mm. pressure. The distillate obtained was redistilled to the same temperature at 9 mm. The combined residues and final distillate represented 14.25 and 83.13 per cent. by volume, respectively, of the original oil.

Repeated fractionation at ordinary pressure of the lower boiling portion gave the following fractions:

Fraction	*Temp. range*	*Volume*	*Per cent. by volume of original oil*	*Rotation*
I	150–160° C.	32 cc.	8.00	dextro
II	160–163	96.5	24.13	dextro
III	163–168	80	20.00	dextro
IV	168–175	79	19.75	dextro
V	175–185	15.5	3.88	dextro

Dextro Alpha Pinene. The first three fractions each yielded large quantities of a nitrosochloride melting, after purification, at 105° C. The mixing of these nitrosochlorides with pure alpha pinene nitrosochloride, prepared from turpentine oil, caused no depression of the melting point. Portions of the fractions were then oxidized by means of potassium permanganate according to the method of Tiemann and Semmler (9). The acid residues, when treated with semicarbazide hydrochloride, yielded semicarbazones melting at 203° C., thereby identifying pinenic acid. The oxidation product of alpha pinene.

Dextro Beta Phellandrene. The fourth fraction yielded a large amount of a nitrite. After repeated precipitation from chloroformic solution with methyl alcohol, crystals having a melting point of 103° C. were obtained. This served to identify the fraction as beta phellandrene.

Fraction V. This fraction yielded no crystalline bromide or hydrochloride, thereby indicating the absence of limonene or dipentene. Aside from a small amount of beta phellandrene, no other terpene could be identified.

Saponification and Fractionation. That portion of the oil which boiled above 85° C. at 9 mm. pressure was saponifid by heating with alcoholic potassium hydroxide solution. The alcohol was distilled

off and the saponified oil was washed with water until free of alkalinity. The aqueous washings were combined and then extracted with ether to remove adhering oil, after which the ether solution was added to the oil. After drying and removing the ether, the oil was fractionated under ordinary pressure with the following results:

Fraction	*Temp. range*	*Volume*	*Per cent. by volume of original oil*
I	185–200° C.	4 cc.	1.00
II	200–220	Solid	....
III	Residue	12.5	3.13

Borneol. Fraction I almost completely solidified when cooled, while the second fraction solidified in the condenser during the process of distillation. Both solids melted at 202° C., and formed phenylurethanes melting at 139° C. which did not depress the melting point of pure borneol phenylurethane.

Fraction III. This fraction, which was dark brown and viscous, was further fractionated up to 250° C. at 12 mm. pressure. The single fraction collected was a yellowish, syrupy liquid, representing only about 1 per cent. of the original oil. It was dissolved in twice its volume of ether and the resulting solution dried. The latter was then saturated with dry hydrogen chloride gas and allowed to stand for three days. Upon spontaneous evaporation of the solvent no crystalline hydrochloride was obtained. As a control, pure cadinene readily yielded its di-hydrochloride using the same procedure. It appears, therefore, that neither of the sesquiterpenes, cadienene nor picene, found by Lehman and Lynn in the oil from T. heterophylla, is present in this oil.

Combined Acids. The aqueous potassium hydroxide extract from saponification was made acid with dilute sulphuric and steam distilled. The distillate possessed an acrid, rancid odor and had a small amount of oily material floating on the surface. It was neutralized with sodium carbonate solution and evaporated to dryness. Benzoic acid was identified in the residue by means of melting point and qualitative tests. Acetic acid was also found to be present, its identification being made in the usual manner. Traces of other volatile acids, such as butyric and valeric, were probably present as indicated by the odor of the acidified residue.

Summary. The leaves and twigs of Tsuga mertensiana yielded 0.27 per cent. of a volatile oil, the general constants of which were determined. The oil was found to consist of over 52 per cent. of d-α-pinene, together with approximately 23.63 per cent. of d-β-phellandrene; 8.46 per cent. of esters, calculated as bornyl acetate; 2.91 per cent. of free borneol; also free benzoic acid and traces of phenols. Acetic and benzoic acids constituted the major part of the combined acids. No positive evidence of the presence of sesquiterpenes could be obtained.

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THE NEW NATIONAL FORMULARY
ITS SIGNIFICANCE TO THE RETAIL PHARMACIST

By Aaron Lichtin, Ph. G.

CURRENT reports seem to reveal that there is a recognition on the part of the medical profession that the swing towards drug-nihilism has reached its peak, and a sound return to the use of remedial agents of proved therapeutic usefulness is indicated. To quote from a recent report by the Council on Medical Education and Hospitals of the American Medical Association: "The purpose of this brief survey has been to present definite evidence to the medical profession that our recent graduates know little about the use of drugs when they begin the practice of medicine. The statistics serve to substantiate the current rumors frequently heard about the shortcomings of our younger physicians. While considerations for improving this serious situation are the immediate concern of the teaching profession, a plea is made to the practicing physician to endeavor to do what he can to keep out of the ranks of nihilism and improve his own selection and utilization of drugs. The practitioner can accomplish this by giving more attention to discussions on desirable drug therapy and proved newly introduced remedies that appear regularly in ethical medical journals, and less to the self-praising advertisements that fill uncritical medical publications." *

The report just quoted suggests a splendid opportunity to the pharmacist, who is strongly interested in his prescription department, to advance the use of official remedies, by keeping his physician-patrons informed on the most recent developments in this field of therapeutic agents. The N. F. VI recently published, which becomes official on June 1, 1936, contains an abundant and valuable store of material which can be utilized in the practical application of the aforementioned opportunity.

It is recommended that every pharmacist procure a copy of the new N. F. at once. A perusal of its pages will reveal to him that the book contains 689 monographs. The drugs, chemicals and preparations described in these monographs have not been selected by a hit or miss method, but by careful surveys of the drug requirements

* *Journal of the American Medical Association*, Vol. 106, No. 5, February 1, 1936, p. 405.

of the country. Based on the surveys which involved the reading and ingredient tabulation of more than 120,000 prescriptions from all over the country, the N. F. Committee of Revision established as an admission basis a usage of one or more times in each 10,000 prescriptions filled annually in the U. S. as 250 million, as determined by several surveys, any article admitted into the N. F. VI, is used an average of 25,000 times a year. This fact is most significant, for it conclusively demonstrates that the N. F. is not a repository of obsolete preparations as some would have us believe, but a selection of medicaments of wide usefulness.

An inspection of the various monographs will reveal some very interesting information. A number of new chemicals and animal drugs, hitherto unofficial, have been added. Example are: Chlorthymol, Gentian Violet, Papaverine Hydrochloride, Potassium Guiacolsulfonate, Potassium Thiocyanate, Tetrachlorethylene, etc.; Corpus Luteum, Whole Ovarian, Pituitary, Anterior Pituitary, Ovarian Residue and Suprarenal have been recognized. A variety of formulas for ampules and a number of monographs on tablets have been admitted. One wonders why the Revision Committee did not include processes for tablet manufacture. Among the newly admitted preparations one finds Elixir of Amidopyrine, Elixir of Phenobarbital, Elixir of Sodium Thiocyanate, Emulsion of Liquid Petrolatum with Phenolphthalein, Ephedrine Spray, Ephedrine Solution, Ephedrine Jelly, Syrup of Ephedrine Sulfate, Aromatic Sodium Perborate, N. F., etc. Pharmacists will at once recognize that the newly admitted articles reflect the more recent tendencies in medical and dental prescribing, and will realize that the N. F. VI Revision Committee spared no effort to bring the book up to date.

There are several changes in titles. Examples are: Liquor Antisepticus to Liquor Antisepticus N. F.; Bitumen Sulphonatum to Ichthamoll; Inunctum Mentholis Comp. to Unguentum Mentholis Comp. and many others. All of these changes may be found on pages 510-511. There are several changes in formulas. A notable one is in that of Liquor Antisepticus N. F. Pharmacists should familiarize themselves with the revised formula of this popular preparation. Several changes in orthography, in harmony with modern trends, have been noted. Thus sulphur is now spelled sulfur; sulphonate—sulfonate, etc.

An interesting feature of this Revision was the formation of an Associate Committee on Dental Preparations, an Associate Committee on Veterinary Preparations and an Associate Committee on Pediatrics with the purpose of introducing into this and later revisions articles which are of particular interest in veterinary, pediatric and dental practices, together with particular dosage, or directions applicable to the special use of these articles. The reader is referred to the dosage under Kamala, Liquor Nucis Vomicæ Alkaloidorm; the directions under Liquor Sodii Boratis Comp. and several others. Storage directions are given in a number of the monographs.

Pages 436-437 are devoted to a long list of laboratory and diagnostic reagents and culture media together with methods of preparations, which will prove of inestimable value to the pharmacist who desires to prepare these articles for his medical patrons who operate clinical laboratories.

Pages 485-503 are devoted to the history of the N. F., Principles of Revision and a list of the Revision Personnel.

The new N. F. is a book of which the pharmacists of the land may be justly proud. It gives the pharmacist an opportunity and a means with which to combat the commercial domination of therapeutics.

The new N. F. is the TEXT BOOK *Par Excellence* for the pharmacist who would prepare pharmaceutical preparations with which to detail his patrons in the medical, dental, and veterinary professions, thereby rendering a useful service to them and to the consuming public.

The pharmacist's book-shelf is incomplete without this volume.

ARTEMISIA RIGIDA (NUTT.) GRAY

By H. C. Vincent* and R. L. McMurray**

Introduction

IN a previous article a report (1) was made on the fixed and volatile oils of *Artemisia rigida* (Nutt.) Gray which were isolated from this somewhat rare species of Sagebrush. The prime purpose of this work was a preliminary examination of the plant as a possible source of Santonin. Santonin has been found in some species of *Artemisias* and, therefore, it was thought that perhaps this indigenous species might also produce the drug now generally obtained from other countries.

Artemisia rigida (Nutt.) Gray is also known as Stiff Sagebrush (2), Scab-land Sagebrush (3, 4), and Little Black Sage (brush) (5).

No record has been found of any work on this plant, aside from that claimed by Kennedy and Dinsmore (6), of which perhaps a doubt might be raised as to whether the plants they considered were the true species referred to in this report.

Experimental Work

The above ground, blooming plants and leaves were collected, dried and ground to a No. 20 powder. Refuse matter was carefully eliminated. Identification of the type specimens was corroborated at Gray Herbarium and the Rocky Mountain Herbarium at the University of Wyoming.

(a) Moisture was determined by the Dean (7) method and amounted to 6.65 per cent.

(b) Selective solvent determinations were made and calculated to both the air-dried and anhydrous condition (based on a moisture content of 6.65 per cent. as follows:

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**Ohio State University, College of Pharmacy.

	Air-dried Per cent.	*Moisture-free Per cent.*
Petroleum ether	4.69	5.02
Ether	3.28	3.51
Alcohol (absolute)	16.58	17.78
HCl (1 per cent.)	3.39	3.63
(c) *Crude fiber* (8)	29.29	32.11
(d) *Pentosans* (9)	13.48	14.44
(e) *Ash,* crude (9)	4.79	5.13
" water insoluble	3.02	3.23
" water soluble	1.77	1.90
" acid insoluble	0.72	0.77
" acid soluble	2.30	2.46

Ash, constituents:	*Per cent.*
sand	10.55
SiO_2	11.59
P_2O_5	4.57
Fe_2O_3 and Al_2O_3	3.95
CaO	17.55
MgO	6.38
Cl	2.09
SO_3	8.67

(f) *Inulin* (10) was found to be present by microscopical identification of the crystals formed in sections of root subjected to the action of absolute alcohol and by tests with the following reagents: (a) Wagner's; (b) alpha-naphthol; (c) thymol; (d) phloroglucin; (e) pyrogallol; (f) resorcinol; and (g) guaiacol and sulphuric acid.

(g) *Santonin* was not found by the method of Pain (11), using spirit of ethyl nitrite and alcoholic KOH. Positive results were simultaneously obtained on flower heads of *Artemisia pauciflora* (Ledebour) Weber.

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Paraldehyde and Benzyl Alcohol—In Childbirth Anesthesia

A safe way of taking the suffering out of childbirth has long been a goal of medical scientists as well as the prayer of countless mothers the world over. One by one, various anesthetics and pain-killing agents have been tried—chloroform, ether, nitrous oxide or "laughing gas," twilight sleep, to name a few familiar ones.

Some have been rejected because of danger to mother or child. Others were of limited use because complicated apparatus and skilled anesthetists were needed to give them. Others have brought only partial relief of suffering, or have relieved the pain in some cases and not in others.

The latest step in the long quest is the development of a new anesthetic mixture consisting of paraldehyde, the polymer of acetaldehyde, and benzyl alcohol. It was developed in the pharmacology laboratories of George Washington University's medical school by Dr. George B. Roth, in collaboration with Dr. Howard F. Kane, head of the obstetrical department where it was given its clinical trial on mothers in childbirth.

Safety is one of the greatest advantages of the new anesthetic mixture. It is only mildly toxic, and if pure and properly given is considered safer than any of the other methods used to relieve suffering in childbirth. It has been tried in 500 cases at George Washington University Hospital and no ill effects have been noted in mother or child. It can be easily given, which is another big advantage.

THE KILMER BOTANICAL GARDEN†

By Marin S. Dunn

Professor of Biology and Director of the Kilmer Botanical Garden at the Philadelphia College of Pharmacy and Science

THE Kilmer Botanical Garden was established upon the campus of the Philadelphia College of Pharmacy and Science in the Spring (1935) as a memorial to the late Frederick B. Kilmer of New Brunswick, New Jersey, long a trustee of the College. Dr. Kilmer, as you know, had been actively interested in the advancement of pharmacognosy. One of the ways by which he showed this interest some years ago was the establishment of a fund at the Philadelphia College of Pharmacy and Science, the interest of which was to be used for researches in pharmacognosy and plant chemistry.

When approached in the Autumn of 1934 by Dean Charles H. La Wall, he enthusiastically gave his approval of the use of the accumulated interest of this fund in the establishment of a botanical garden devoted to raising, on a small scale, certain plants of botanical and pharmacognostic interest. From then until his death in December, Dr. Kilmer was in constant touch with those having to do with

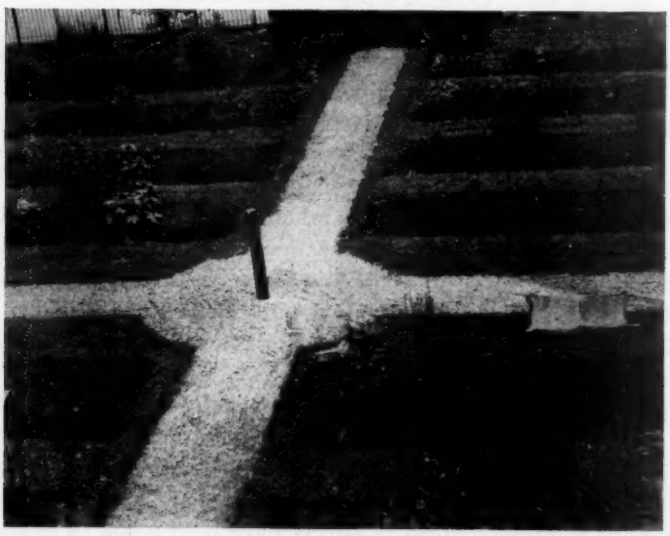

Fig. 1—Aerial View of a Part of Kilmer Botanical Garden.

† Read before the Plant Science Seminar, Portland, Oregon, 1935.

the Garden. Consequently, the Garden as now established shows the influence of Dr. Kilmer's foresight and wisdom. It is beautiful and it is practical.

The Garden is located on an irregular plot of land at the side of the College building. It is completely enclosed by the sides of certain buildings connected by six foot iron-picket fence. Along one side is a rustic cedar and redwood pergola with flagstone flooring, a gift of the graduating class of June, 1935, while in the center at the intersection of the two main walks is a sundial.

There are twelve beds of various lengths (figure 1),—each six feet wide. All beds have been made by excavating to a depth of ten inches and filling with first-class topsoil—suitable amounts of hyper-humus and well-rotted cow manure being incorporated to form a mixture.

The paths between the beds are about three feet wide and of grass. The two main walks, however, which intersect at the sundial are formed of six inches of cinders and two inches of slag—the above, well tamped.

In a general way, although not without exceptions, taxonomic arrangement (*Gray's Manual,* 7th edition) of the plants in the beds has been given preference. Hence the first bed is devoted to the

Fig. 2—Northern View of the Kilmer Botanical Garden.

Gramineæ, the last to the Compositæ and those between to their proper families. On the other hand, taxonomic arrangement has not been attempted in the border—the plants being located where it was thought they would thrive best or where they would serve some particular purpose.

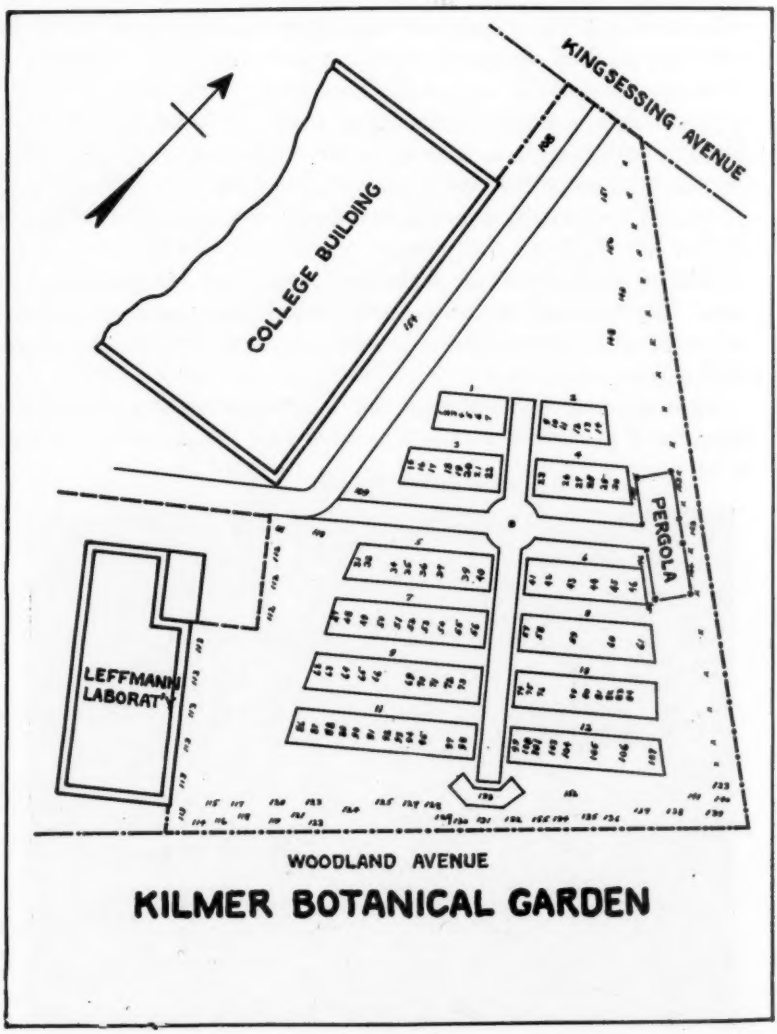

Fig. 3.

It is our hope that the Garden will serve as a place (1) where students studying botany and pharmacognosy will have opportunity to acquaint themselves with certain living medicinal and economic plants which otherwise they might only see as bits of roots, stems, leaves, etc., or at the best as herbarium sheets or pictures; (2) where advanced workers may actually grow material for their problems; (3) where visiting botanists and pharmacognocists and others interested in plants may find pleasure and profit.

As time goes on, we expect to enlarge the Garden, adding to our collection many plants we now lack. A pool for various aquatics located at the upper, narrower end of the Garden (shown on figure 3) is already planned for next year. The water for this pool will be circulated by a small pump located in the College basement.

The writer would like to thank the many friends who have contributed seeds and seedlings for the Garden this year, particularly Dr. A. F. Sievers of the Bureau of Plant Industry, Washington, D. C., Mr. John A. Manley, New Brunswick, N. J., and Mr. Ludwig Metzger of the University of Washington, College of Pharmacy at Seattle.

A list of plants grown in the Kilmer Garden during 1935 follows:

1. Zea Mays
2. Secale cereale
3. Avena sativa
4. Agropyron repens
5. Triticum sativum
6. Coix Lácryma—Jòbi
7. Iris versicolor
9. Veratrum viride
10. Convallaria majalis
11. Helleborus niger
12. Dioscorea villosa
13. Humulus lupulus
14. Cannabis sativa
15. Saponaria officinalis
16. Phytolacca americana
17. Rumex crispus
18. Cimicifuga racemosa
19. Podophyllum peltatum
20. Chenopodium ambrosioides anthelminticum
21. Caulophyllum thalictroides
22. Rheum officinale
23. Sanguinaria canadensis
26. Isatis tinctoria
27. Brassica nigra
28. Brassica alba
29. Brassica Napus
30. Hydrangea arborescens
31. Glycyrrhiza lepidota
32. Baptisia australis
34. Galega officinalis
35. Glycine hispida
36. Trigonella Foènum—Graècum
37. Geranium maculatum
39. Linum usitatissimum
40. Ruta graveolens
41. Rhamnus Purshiana
42. Althaea rosea
43. Althaea officinalis
44. Ricinus communis
45. Foeniculum vulgare
46. Conium maculatum
47. Coriandrum sativum
48. Carum Carvi

49. Peucedanum graveolens
50. Pimpinella anisum
51. Petroselinum sativum
52. Angelica Archangelica
53. Apocynum cannabinum
54. Gelsemium sempervirens.
55. Apocynum androsaemifolium
56. Asclepias tuberosa
57. Capsicum sp.
58. Datura Stramonium
59. Capsicum sp.
60. Atropa Belladonna
61. Solanum Dulcamara
62. Veronica virginica
63. Digitalis purpurea
64. Verbascum Thapsus
65. Monarda fistulosa
66. Symphytum officinale
69. Ocimum Basilicum
70. Monarda punctata
71. Marrubium vulgare
72. Lavandula spica
73. Salvia officinalis
74. Mentha piperita
75. Mentha longifolia
76. Thymus vulgaris
79. Monarda didyma
80. Satureja hortensis
81. Rosmarinus officinalis
82. Thymus Serpyllum
83. Mentha viridis
84. Melissa officinalis
86. Valeriana officinalis
87. Lobelia cardinalis
88. Verbena hastata
89. Arctium Lappa
90. Lactuca, sp.
91. Eupatorium perfoliatum
92. Brauneria angustifolia
93. Artemisia Abrotanum
94. Artemisia Dracunculus
95. Artemisia frigida
97. Matricaria Chamomilla
98. Calendula officinalis
99. Taraxacum officinale
100. Anthemis nobilis
101. Eupatorium purpureum
103. Achillea Millefolium
104. Artemisia Absinthium
105. Artemisia vulgaris
106. Tanacetum vulgare
107. Inula Helenium
108. Rosa sp.
109. Juniperus canadensis
110. Juniperus communis
111. Pinus Strobus
112. Tsuga canadensis
113. Pinus resinosa
114. Fraxinus, americana
115. Ptelea trifoliata
116. Physocarpus opulifolium
117. Taxus cuspidata
118. Hamamelis virginiana
119. Rhus glabra
120. Rhus aromatica
121. Abies balsamea
122. Aralia spinosa
123. Berberis aquifolium
124. Oxydendrum arboreum
125. Viburnum prunifolium
127. Euonymus atropurpurea
128. Euonymous europaea
129. Styrax japonica
130. Rhus copallina
131. Morus alba
132. Chionanthus virginica
133. Thuja occidentalis
134. Rhus typhina
135. Viburnum opulus
136. Robinia Pseudo-Acacia
137. Crataegus cordata
138. Quercus alba
139. Picea excelsa
140. Rhamnus cathartica
141. Euonymus alata
143. Populus nigra italica
144. Wisteria sp.
146. Clematis sp.
147. Clematis sp.
148. Agave sisalana
149. Magnolia Soulangeana
150. Betula alba
151. Cornus florida
152. Sassafras variifolium
153. Aristolochia Sipho
154. Ligustrum californicum
155. Liquidambar Styraciflua

SCIENTIFIC AND TECHNICAL ABSTRACTS

Compiled by Linwood F. Tice, M. Sc.

Protamine Insulinate, H. C. Hagedorn, B. N. Jensen, N. B. Krarup and I. Wodstrup, *J. A. M. A.,* 106, 177 (1936). The treatment of diabetes by the injection of insulin frequently gives rise to certain difficulties, inasmuch as the continuous secretion of the normal pancreas must be replaced by a few daily injections into the subcutaneous tissue. In most cases serious disturbances are avoided through the action of other mechanisms of the body, regulating blood sugar but in certain severe cases pronounced oscillations of the blood sugar may occur.

The high rate of absorption of insulin after injection is the factor responsible for this fluctuation and, consequently, three general methods have heretofore been tried to retard the rate of insulin absorption. They are

1. Injecting the insulin as a suspension or emulsion in oil.
2. Injecting it together with a vasoconstrictor.
3. Injecting an insulin compound sparingly soluble in the tissue fluid.

The third method has received considerable attention by the authors with little success until the present work was accomplished.

The idea was conceived that an insulin compound possessing an isoelectric point corresponding to the pH of tissue fluid would provide a slowly soluble material. This is in accordance with the common knowledge that a substance at its isoelectric point exhibits a minimum in its solubility curve.

Different groups of substances were tried—kyrin, histones, globins and protamines, the latter only producing a compound warranting clinical trial. A solution of protamine insulinate adjusted to a pH of 7.3 precipitates the insulinate from solution. Consequently, such a product must be injected as a suspension. A new and previously unreported protamine obtained from the sperm of Salmo iridius when combined with insulin gave a compound the least soluble of all investigated in tissue fluid.

Clinical trial of this new insulin compound has given evidence that it possesses many advantages over ordinary insulin in certain diabetic cases. The tests were made by comparing periods in which patients were treated with ordinary insulin with periods in which, under exactly the same conditions otherwise, they were treated with protamine insulinate.

The results indicate that the sharp peak effect usually seen three or four hours after the injection of ordinary insulin is largely avoided by the use of protamine insulinate. Furthermore, the effect of protamine insulinate is more prolonged, roughly about twice as long as that of ordinary insulin. Without increasing the number of injections it was possible to reduce the blood sugar fluctuations, reduce or suppress glycosuria, the ammonia excretion (resulting from acidosis) and at the same time reduce the risk of the occurrence of hypoglycemia.

No ill effects were observed, nor were there any local or protein reactions following injection.

In coma, ordinary insulin is to be preferred as it is more rapid in action and, furthermore, in cases where ordinary insulin produces satisfactory results the use of protamine insulinate is of no special value.

Several charts showing the variation in blood sugar level with various patients are presented illustrating the advantages of protamine insulinate as already described.

A Rapid Method of Determining the Amount of Barbital Derivatives in Urine and Medicinal Products. H. Oettel, *Arch. Pharmaz. Ber. Dtsch. Pharmaz. Ges. 46,* 1 (1936).

An exact quantitative determination of small amounts of barbituric acid derivatives in urine is quite difficult and not highly accurate without much highly specialized apparatus. By precipitation methods it is usually decided whether any of these derivatives is present in a sample. However, these derivatives are very widely used and they may be slowly excreted by the body so that a mere qualitative finding of barbituric acid derivatives in the urine is of little diagnostic value.

The quantitative estimation proposed is based on the colorimetric reaction of cobalt acetate with the barbituric acid derivative, a blue color being produced. The method is as follows:

Ten cc. of urine are acidulated with several drops of n/10 hydrochloric acid and then shaken vigorously with 20 cc. of chloroform in

a small separatory funnel. After separation the chloroformic layer is filtered through a hard filter previously wet with chloroform and 2 cc. of the clear, colorless chloroform solution placed in each of three test tubes A, B and C. From a 0.2 per cent. solution of cobalt acetate in absolute methyl alcohol one adds to A 0.05 cc., to B 0.1 cc. and to C 0.15 cc, and after mixing there is then added an equal amount (0.05, 0.1, 0.15 cc.) of a 0.2 per cent. solution of lithium hydroxide in absolute methyl alcohol. All solutions must be measured with a micropipette or a microburette and the lithium hydroxide must not be replaced with some other alkali.

If in all three samples A, B and C there is developed an intense blue color the initial urine sample contains more than 20 mg. per cent. of a barbituric acid derivative (1 cc. of the chloroform solution = about 0.1 mg.). If the sample A and B are positive and C is negative or the color disappears in about a minute the urine contains about 10 mg. per cent. If only A is positive and the color in B is quickly lost the urine contains 5 mg. per cent. of barbituric acid derivative. With practice the intermediate amounts can be estimated.

If all three samples are positive or, only B and C, the remainder of the chloroform solution is diluted with an equal quantity of chloroform and the tests repeated, etc. With exceedingly large amounts of barbituric acid derivatives present it is possible for A, B and C to be negative until the chloroformic extract is highly diluted. The reaction is so sensitive that following therapeutic doses of "Veronal" a positive reaction may be obtained. "Phanodorm," a very easily broken down derivative, produces a positive reaction in the urine following a single therapeutic dose. On the other hand it should be emphasized that some derivatives, e. g., "Pernocton" and "Noctal", are in a pure form only difficultly soluble, or form insoluble complex compounds.

The method may also be applied to the approximation of the content of barbituric acid derivatives in a medicinal preparation.

The Effect of Chlorides in the Colorimetric Determination of Nitrates in Water. R. Danet, *J. pharm. chim. 23,* 34 (1936) through *Squibb Abstracts 9,* 238 (1936).

The use of the colorimetric scale [S. A. B. *8,* 1602 (1935)] for the determination of nitrates in water with sulfo-phenic reagent is

quite satisfactory for pure aqueous solutions. However, error is introduced when the solution to be tested contains chlorides. It has been definitely shown that these decrease the intensity of the color reaction. Error is further introduced with the use of the color scale in that the reagent is subject to variation in hydration which affects the color reaction. In the interest of accuracy it is best to make comparisons with a control solution to which is added an amount of chloride equal to that present in the solution to be examined.

Lip Stick Dermatitis. J. A. M. A. 106, 470 (1936).

It has been known for some time that the contact of certain substances with the skin may ultimately produce sensitization followed by definite symptoms of dermatitis. The number of offending substances has become considerable. In addition to certain rubber bases in adhesive plaster, such substances as butesin picrate, lip stick, lip rouge, perfumes, leather hat bands, dyes from toilet seats, and solvents from shoe dyes has been reported as etiologic agents in contact dermatitis.

One interesting case of lip stick dermatitis has been described in the literature. A patient was sensitive to two shades of lip stick of a certain brand but showed no reaction to other kinds tested. Patch tests on the arm were made on the patient and on normal control subjects to detect sensitivity to the individual ingredients of the lip stick. The oleaginous base and a number of commonly used aniline dyes gave negative results. The application of the perfume, however, either alone or in combination with the other ingredients produced a reaction consisting of a vesicular and erythematous patch, thus indicating that the perfume was the causative factor. Further tests were made in which the various possible components of the perfume were used. It was found that methyl heptine carbonate produced a marked reaction in the patient and nineteen of thirty-eight control subjects.

Reactions of this type emphasize the urgent need for careful experimental study by the manufacturer to detect possible deleterious effects of the ingredients of proprietary preparations to be applied to the skin before such substances are released for general use.

The Pharmacology of the Nitrite Effect of Bismuth Subnitrate. E. J. Stieglitz and A. E. Palmer, *J. Pharm. and Exper. Therap. 56,* 216 (1936).

Bismuth subnitrate has been used in the treatment of arterial hypertension. It has been known that too great a dose of bismuth subnitrate results in nitrite poisoning and methemoglobin formation. This is particularly prone to occur in children.

Although the reduction of bismuth subnitrate is difficultly carried out with chemical agents, it is easily effected by certain organisms. Bacillus coli, for example, which exists in the lower bowel breaks down the subnitrate to nitrite.

In vitro experiments, using a human strain of B. coli, gave the following results. Nitrite was developed, the concentration being independent of the amount of subnitrate present providing there was an excess. The amount of nitrite present in cultures at pH 6, 7 and 8 was increasingly greater although this may be due to simply a greater stability on the part of nitrite in an alkaline medium. The nitrite concentration was found to rise rapidly and then level off due to some process whereby nitrite formed is destroyed.

The maximum yield of nitrite over a period of 74 hours was 16 per cent. of the theoretically available subnitrate which was exposed to the bacteria. In shorter experiments of one-half hour incubation of the mature cultures 0.66 per cent. of the theoretical nitrite from bismuth subnitrate was yielded. In view of the fact that the bacterial reduction of nitrate to nitrite is much greater in a semisolid medium such as exists in the bowel and that nitrite absorption from the mucosa probably prevents the destruction of some of the nitrite by the bacteria it was concluded that the nitrite made available for physiological effects is considerably greater than was indicated by these tests.

In vivo experiments definitely showed that following the administration of three 10 Gr. doses of bismuth subnitrate daily there was a definite rise of blood nitrite concentration associated with a depression of arterial tension. One patient did not show any vasomotor effect but neither was there any detectable in the blood nitrite content. The reason for this individual variability is unknown.

Belladonna Alkaloids in Liver Extract. Pharm. J. 136, 257 (1936).

The tests employed to determine the purity of chemical substances are usually intended to exclude the presence of poisonous or other undesirable impurities which may be present in the compound in the natural state or be derived from materials or utensils used in the course of manufacture. A report in the *British Medical Journal* for February 29 gave the details of a case of belladonna poisoning in a patient suffering from pernicious anemia who was being treated with a liquid liver extract. Chemical and pharmacological examinations of the liver extract showed the presence of belladonna alkaloids in quantity equivalent to 1/25 grain in each fluid ounce. Investigation of the likely sources of this alkaloid rules out the possibility of contamination due to the extract having been placed in a bottle which had previously contained a belladonna preparation. Presumably other sources of contamination during manufacture were also remote. The conclusion was that animals from whose livers the extract was prepared had eaten belladonna leaves or fruit a short time before being killed. In view of this reasoning it is quite possible that tests to exclude the presence of alkaloids may be considered desirable for liver extract. The question is raised whether belladonna is the only plant conceivably dangerous in this way and whether the liver is the only medicinally used organ capable of storing poisonous alkaloids.

The Determination of 2-Phenyl-4-Quinoline Carboxylic Acid (Cinchophen) in the Presence of Calicylic and Acetylsalicyclic Acids. A Castiglioni, *Ann. Chim. applicata 25,* 240 (1935) through *Pharm. Zentralhalle 77,* 151 (1936).

Cinchophen produces with silicotungstic acid an insoluble double compound with the composition $12WO_3.SiO_2.2H_2O.4C_{16}H_{11}O_2N.2H_2O$. Salicylic acid and aspirin do not give such a compound but they are precipitated from their alkaline solution by silicotungstic acid and HCl. A precipitate obtained by treating a solution of these three substances with silicotungstic acid consists of salicylic acid, aspirin and the silicotungstic complex of cinchophen. Thus if the precipitate be ashed and the weight of the silicotungstic acid anhydride obtained one can calculate the amount of cinchophen originally present by the factor 0.3504.

Caesarian Operation Origin

Julius Caesar, contrary to widespread belief, was not born by means of a Caesarean operation. Neither did he have anything to do with enactment of the old Roman law that forbade burial of a woman who died in pregnancy before the body of the unborn child had been removed by surgery.

Not until long after the days of Julius Caesar was the Caesarean operation successfully performed on living women, and it is a matter of historical record that Julius Caesar's mother, Julia, lived for many years after his birth.

Perfume and Poison Too

Doctors have recently traced some cases of lip stick dermatitis—the skin disorder that occasionally develops among users of a lip rouge to the perfume it contains.

A particular offender is a perfume containing methyl heptine carbonate, a recent issue of *The Journal of the American Medical Association* states.

A young woman came to her doctor with a breaking out on the skin, which he traced to her use of lip stick. She had been using a certain brand for years with no ill effects until she changed shades.

By patch tests on the girl's arm, the physician found that she was sensitive not to the oil or dyes in the rouge, but only to the perfume used in two shades of lip stick of the brand she had been using.

The same test was made on thirty-eight other women. Exactly half of the thirty-eight were sensitive to the lip stick that had methyl heptine carbonate in its perfume. Other possible components of the perfume used in lip sticks gave no reaction.

Face creams have also frequently shown undue skin reactions in sensitive users, and more than likely due to the perfume contained therein.

BOOK REVIEW

TOXICOLOGICAL MICRO-ANALYSIS. Dr. L. Rosenthaler in this book of 368 pages deals with the qualitative microchemistry of poisons and of many other chemical substances which might have to be searched for in legal cases.

Numerous (173) splendid text illustrations show the form, though not the size, of the characteristic crystal precipitates.

Chapter I contains the methods of separation, as micro-sublimation, micro-distillation, micro-extraction, and capillar-analysis.

Chapter II includes micro-physical methods (as micro-melting and micro-boiling and spectral analysis),—and micro-chemical methods (as those of crystal precipitation, color and capillary reactions and spot tests).

In the specific part the micro-detective of inorganic and organic substances, including blood and sperma, is discussed, with numerous explanatory footnotes and references to original literature. There are also very helpful tabulations, as one recording the characteristic crystalline precipitates of barbituric acid derivatives. A list of about 75 reagents is appended.

The book, obviously up to date, is written with the well-known thoroughness of the author, an expert in this field. It would be of great help to toxicologists and micro-analysts—as well as to students unfamiliar with the newer tools and tests of micro-analysis.

ARNO VIEHOEVER.